SMART 3.0 : Simply Powerful!

Both amazingly Advanced and Powerful, still the most User-Friendly Video-Tracking on the market!

SOFTWARE OVERVIEW

Smart 3.0, the latest release of Panlab's SMART video tracking system features the most flexible and easy-to-learn software for the automated evaluation of behavior in the widest range of pre-clinical and neuroscience applications.

Utilizing our advanced image analysis, SMART 3.0 allows the recording of activity, trajectories, events, social interactions, and global activity. SMART 3.0 provides users the versatility of a modular system with the capabilities of a broadband package. Our enhanced data analysis includes customizable data reports and complete calculations for unlimited behavioral paradigms.

SMART 3.0 was developed with the daily experimental process in mind - easy-to-use interface, highly flexible structure fitting the most applications and budgets. Advanced features ensure reliable data and increased productivity, saving valuable time and resources.

SMART 3.0 emphasizes flexibility, productivity and simplicity - just add your desired settings, SMART 3.0 will do the rest.

Simply powerful.

Focus your time and effort on your research, don't waste it with complex tools!

Key Features

- *More than 15 years of experience in video tracking systems*
- *Flexibility, reliability, productivity and simplicity all combined in the same product!*
- **New** *Modular structure for fitting all experimental needs (basic and advanced) and budgets*
- **New** *Designed with the latest in both hardware and software technologies for increased functionality and maximum productivity for your experiments.*
- *Known as the most user-friendly interface in the market!*
- *Dedicated Customer Service & Support Dept. for insuring consultancy service & post-sales assistance*

EXAMPLE OF APPLICATIONS

ACTIVITY & EXPLORATION - Locomotor Activity, Novel Object Test, Cycling Behavior - ANXIETY - Open-Field, Elevated-Plus Maze, O-Maze, Black And White Test - DEPRESSION - Forced-Swimming Test, Tail-Suspension Test - LEARNING & MEMORY - Water Maze, Radial Maze, T And Y Maze, Fear Conditioning, Object Recognition Test -ADDICTION & REWARD - Conditioned Place Preference, Odor Place Preference - SOCIAL INTERACTIONS - Resident Test - ZEBRAFISH STUDIES - Larvae Tracking - Place Preference Test, etc... And many other applications!

Leaflet

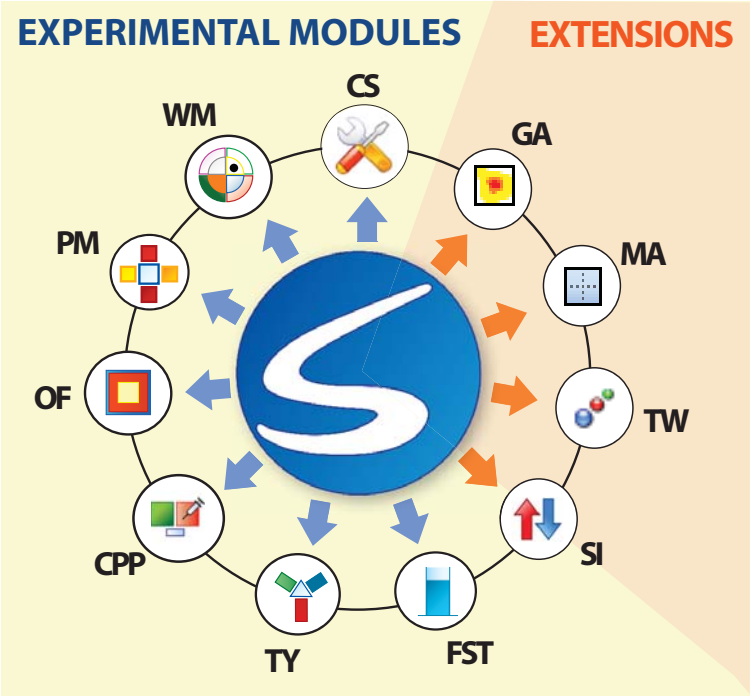
LF0701D

SMART 3.0

OPTIMAL FLEXIBILITY!

SMART 3.0: a new modular design for fulfilling your needs!

With a new modular structure, SMART 3.0 offers the most flexiblity for our customers. The SMART 3.0 platform is the main core of a great number of standard and advanced features. Save time and money: adapt the system to meet your specific needs, and expand as your research requires!



- *Customized Module (SMART-CS)*
  Fully editable system for fitting any experiment (track of 1 animal in any kind of enclosure).
- *Experiment-targeted Modules (SMART-WM, PM, OF, CPP, TY, FST...)*
  Save time with our predefined configuration and data reports for standard experiments.
- *Social Interaction Module/Extension (SMART-SI)*
  Track up to 8 animals in the same arena and study interactions between them.
- *Global Activity Extension (SMART-GA)*
  Increase reliability in activity-related experiments (forced-swimming test, tail-suspension test, etc...).
- *Multiple arena Extension (SMART-MA)*
  Boost the productivity of your laboratory! Simultaneous tracking in different enclosures.
- *TriWise Extension (SMART-TW)*
  Increase precision and behavior recognition! Automated 3-point detection (head, center, base-tail).
- *Input-outpu Extension (SMART-IO)*
  Interact with external devices (stimulus, cues, atlantis island, etc.). Contact us for more information.

NEED FOR FLEXIBILITY & ADVANCED SETTINGS?

Working in a laboratory with advanced needs for behavioral research? - Interested in exploring and opening new research approaches, improving already existing concepts? - Require evaluation system with flexibility of user-editable settings and adaptability to desired criteria?

The SMART customizable module (SMART-CS) provides the most versatile and powerful solution for running specific experimental projects.

- free edition of arenas, zones and associations.
- access to the full options of the Timing settings.
- free definition of calculations and data reports.

NEED FOR SAVING TIME & MONEY?

Have a limited budget? - Need to perform standard behavior experiments but don't have experience with these applications?

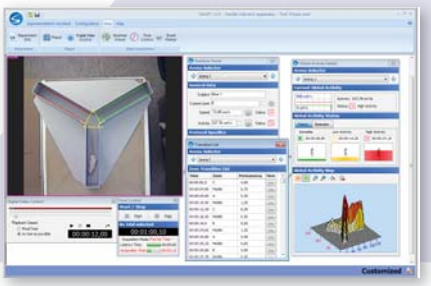
Opt for SMART 3.0 with our pre-configured experimental modules - select only the modules necessary and expand as research needs change.

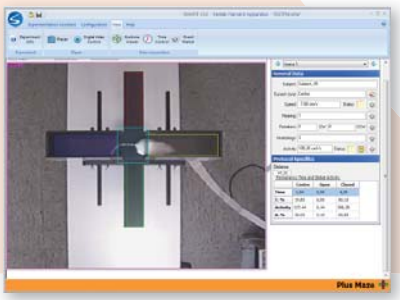
Inherited from the Smart JUNIOR experience, the SMART 3.0. Targeted experimental modules include:

- ready-to-use configurations
- pre-configured runtime panels and data reports for analysis

A perfect option for standard experiments for both our experienced and non-experienced users!

SMART-CS





SMART-WM/PM/OF/CPP/FST/TY

You want to change your mind? Easily adapt the system to your growing scientific demands!

- Easily expand your system from one module to another one or with any of the extension available for enjoying of the highest flexibility and productivity provided by the SMART video-tracking full system. 100% compatibility ensured between all the SMART modules and extensions!
- 1 + 1 = 3: combining modules is getting more than the sum of the individual capacities! Get benefit of the synergy existing between the different modules (convert your pre-configured experiment to a customizable one, take advantage in SMART-CS of the zone templates provided by the SMART experiment-targeted modules).

info@panlab.com - www.panlab.com **PANLAB s.l.u.**

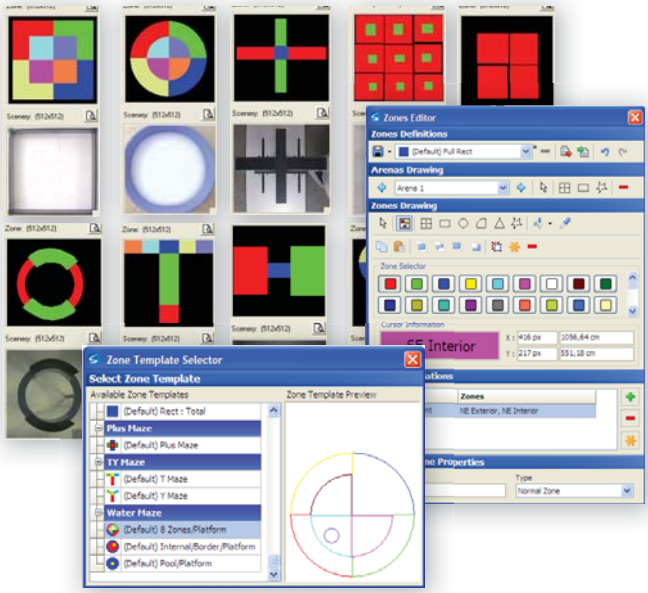
When flexibility meets with creativity and reliability!

SMART 3.0 provides optimized tools for easily adapting the system to your standard and newly designed experimental paradigms - count on reliable data with SMART 3.0 and open the scope of your experiments!

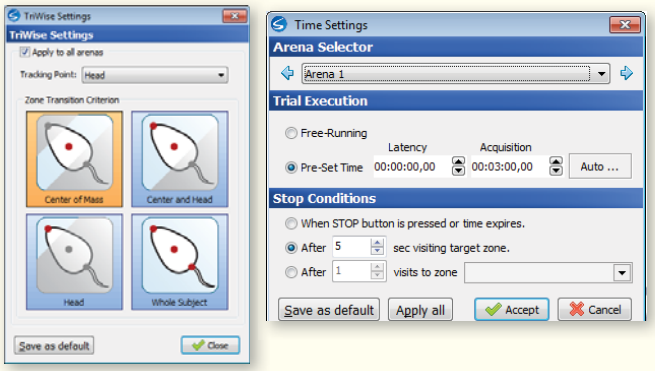
Easily adaptable to any enclosures!

Compatible with any experimental enclosure: mazes (Elevated Plus Maze, O-Maze, T Maze, Y Maze, Radial Maze, Water Maze...), home cage, open-field, experimental boxes (Place Preference, Shuttle, box Operant Conditioning box...), etc.

- **New** Unlimited number of Zones and Arenas available!
- **New** Wide range of specific tools (polyline, square, Ellipse-Circle, grid, quadrant...) to adapt the processed arenas and zones to any experimental enclosure regardless of size and shape.
- Give a name to each zone and define associations between them provinding enhanced creativity for designing new zones as a combination of existing ones.
- Specific zone properties and settings can be defined (Target, Corridor, Arms...) and used for defining specific tracking STOP conditions and calculations (alternation triplet, relative time in zone...).



Meaningful and accurate data using user-defined criteria!

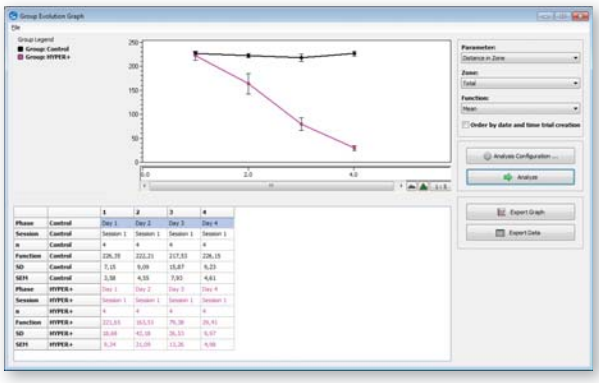


Specific settings provided for the accurate detection of animal behavior according to user-established criteria. The settings can be changed afterwards during analysis and the experiment replayed to obtain a new set of data.

- Speed & Activity threshold for defining animal mouvement pattern (Resting, moving slow or fast)
- Criteria for zone transition definition, social interaction contact and specific behavior detection (rearing, rotation, stretching...)
- Customizable timing settings for data acquisition - manual or automated stop conditions (after user-defined time in a target zone, after visiting an arm, etc.).

Flexible tools providing maximum control during the evolution of the experiment!

- **New** Everything in the same file! Each experiment file contains all the information about the settings (camera settings, calibration, brightness/contrast, detection, timings), zones definitions, subject data base, experiment schedule, registered trials, user-defined analysis reports...
- **New** Subject & Group Data base! Collect all the characteristics of the subjects used in the experiments (name, gender, groups, registered sessions etc...) and easily integrate them in your experimental schedule.
- **New** Everything planned and organized! Scheduler tool provided for managing the subjects and trials in different phases and sessions. Easy retrieval and organization of the final data.
- Control in real-time the evolution and validity of your experiment! Specific RunTime panels provides useful information about the evolution of the current trial: time, zone position, speed, mouvement pattern, zone transition and events lists etc... Each panel can be viewed or hidded at the user's will.
- Validate your data! Replay the video fragments directly related to any registered event and zone transition when using digital video files.



- Keep you data safe! Automated data backup process and experimental file recovery system.
- Get only the data you need! Customize the output analysis reports and the calculations of your interest. Associate a registered track to different zones and generate as many new sets of results as desired!
- **New** Inmediate interpretation! The Group Evolution Graph tool provides a fast view about the differences between groups without having to waste time making calculations in Excel.

SMART 3.0

AMAZINGLY POWERFUL!

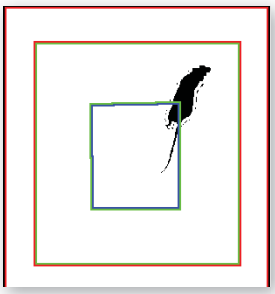
Benefit from the latest technological advances in video tracking technology!

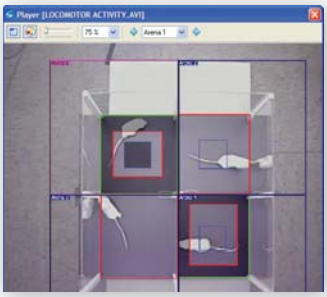
Panlab continuously develps new solutions as new lines of research and technologies emerge. Our development team is constantly striving to maintain the highest quality within our products. We seek to offer our customers innovation, quality, reliability in our application standards.

Advanced center-of-mass based detection

The SMART 3.0 platform provides the specific tools for robust tracking under difficult experimental conditions (low-contrast - black on black and white on white)

- Optimized static background detection algorithms
- Set different brightness and contrast levels in different zones of the same experiment. **New** to SMART 3.0 - now users can optimize with different settings for each arena!

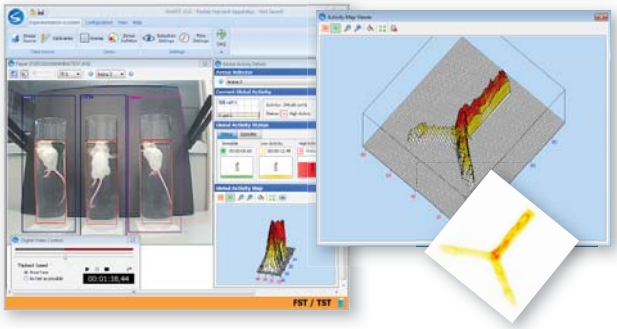




SMART-GA extension: Global Activity detection

Use SMART 3.0's frame-to-frame detection mode for providing additional precision and reliability in the monitoring of animal spontaneous activity and immoblity - a critical point for forced-swimming test, tail-suspension test, fear conditioning test, etc.

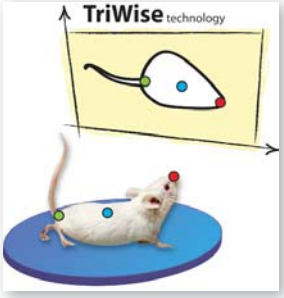
- Get outstanding reports with our new advanced 2D and 3D activity map tool!



SMART-TW extension: 3-points detection

Use the innovative TriWise technology for the 3-points detection of the animal head, center mass and base-tail.

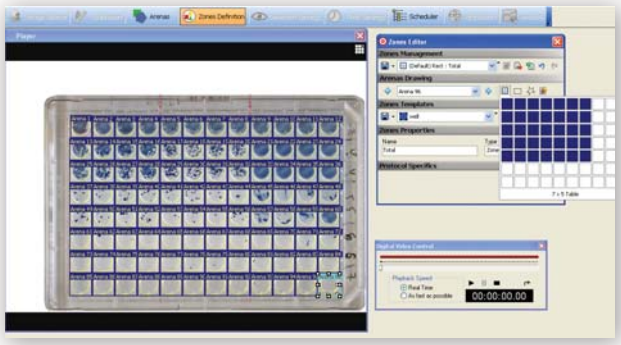
- Automated detection of integrated behaviors such as rearing, rotations and stretchings!
- Specific configurations available for improving behavior detection!



SMART-SI: Social Interaction detection

Use the SMART-SI extension/module for tracking several animals in the same experimental arena.

- Get specific calculation for Social Interaction experiment (number & duration of contacts, relative movements between animals...)
- Enhance your system with the recognition of specific contacts when combined with the SMART-TW extension: head/head, head/tail, head/center of mass etc.

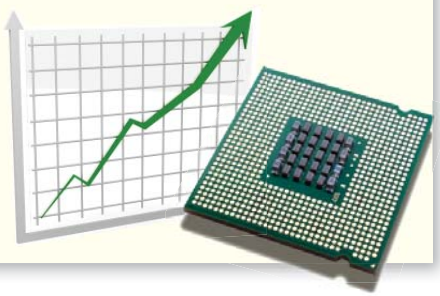


SMART-MA: Multiple arena detection

- The SMART Multiple-Arena extension has been improved for allowing running hundred of independent trials simultaneously! Boost the productivity of your experiments!. Only limited by your computer's performance.

Performance & Control!

- **New** SMART v3.0 uses a specifically designed multi-core processing to take advantage of all the resources of the computer. SMART automatically detects the available processors and distributes the tasks sequentially in order to work always in optimal conditions.
- **New** Automated testing system has been implemented to reinforces the control quality of the software in the diferent phases of the development process.



Outstanding analysis calculations and reports!

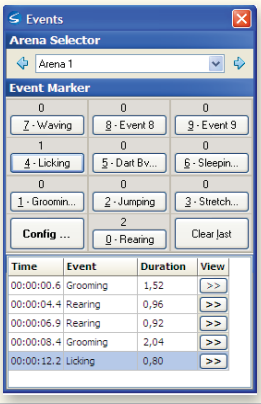
- Improved batch analysis function - individual report can be set for each selected trial (zone definition, calculations, time intervals) and analyzed in one play.
- Provides numeric summary tables directly exportable to Excel® for further data analysis (1 row per trial) as well as track illustration and graphs exportable in image format.
- Provides zone transition list and events list reports with time evolution and distribution of occurrences.
- A wide variety of standard calculations related to tracking: time/distance/entries in zones, average speed... - Advanced calculations also available: alternation triplet, Whishaw's error, mean directionality, parallel index, turning tendency...

Event scoring functions: register integrated behaviors!

Use the SMART Event marker panel or keyboard for manually recording specific behaviors that cannot be identified automatically.

Event list (starting time, duration, starting/stop zone...) and summary report (number, duration, rate...) are given during the analysis process.

Available in all SMART 3.0 platforms!!!



SIMPLIFYING YOUR EXPERIMENTAL LIFE!

The most user-friendly system on the market!

With SMART 3.0, Panlab has taken a step ahead - the advanced user interface and expanded features capabilities allow us to offer what no other video tracking package can!

Save time and effort! Then improve productivity.

- Plug & play technology (USB, built-in digital video recorder, wireless remote control...) - short delivery time - easy to install - no need of specific technical knowledge:.
- **New** Even more user-friendly interface! Modern & fun! New Launch assistant - New Experiment Assistant bar for guiding the user through the different steps of the experiment.
- **New** Every effort was made to simplify the steps and allow users to proceed through their experimental paradigm to collect more data faster and more reliably
- Changing user is not a problem! Save time and effort each time you get a new experimenter to be trained to the experimental paradigms ran in your laboratory.

- **New** USB-Flash key convenient packaging including software user's manual and license. All in the same place!
- The license only apply to the tracking process. Check and analyze acquired data in real time while still in the lab, or extend Smart Analysis on as many computers as needed and analyze at your convenience without any additional cost!

Our team accompanies you with your research!

Dedicated Customer Service & Support Dept.

For more than 30 years, Panlab strives to offer our customers the best service and attention. Our scientific and technical support teams are committed to providing our users with the highest quality with keen attention to detail!

- Consultancy services enabling the customization of techniques/ products related to your field of interest.
- Scientific/technical assistance for the use of the systems in your specific research application.
- Complete solutions for the researcher at hand!
- One-year free remote assistance included!
- High-quality after-sales service
- Customer Notification & Support Center for enriching interactivity between SMART users and Panlab team (coming soon!).

Notificaciones
SMART 3D just released!
Come on and visit us at FENS 2011
Did you know that ...
The most important for me is ...
Automated rearing evaluation using SMART
New handy software for NIBP
Contact us
Customer Service

SMART 3.0

PROVIDING COMPLETE SOLUTIONS - FROM THE CAMERA TO THE DATA REPORT!

Wide variety of image sources

SMART offers maximum versatility - researchers can opt for live image or digital video files - depending on their application requirements. Both image sources are handled with the same outstanding flexibility and analysis features.

"Live image" source

Data acquisition can be performed online during the "live" experiment simply by connecting an external camera (directly of through a image digitalizer) or a video reader device (VHS, DVD devices). Alternatively, the experiment can be recorded via video camera, or video digital recorder and processed on- or off-line.

"Digital video digital" source

Experimental images are recorded in digital format and are transferred into the computer hard drive for SMART tracking process. Standard digital formats such as MPG, AVI, DIVX and VOB are aimed to be supported by SMART (ask details to your local sales delegate)

Cameras

- Standard Analog Cameras or mini CCD Cameras with varifocal lens
- WIA-compatible Cameras
- Infrared Cameras for near-dark applications
- USB or Web Cameras
- Multiple-camera frame grabber board

RECORD-IT! Our solutions for digital video recording!

Ensure traceability and security by saving the image of the experiment in a digital video file!

Panlab specially designed the RECORD-IT! range of advanced built-in and external solutions for storing the video of your experiments. Each solution is 100% compatible with the SMART video-tracking system!

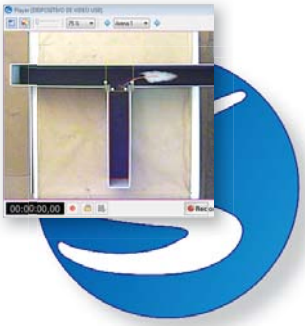
The RECORD-IT! external solutions can be easily integrated with the Panlab family of video-tracking products (SMART 3.0 release as well as previous versions of SMART and Smart JUNIOR) and any other video-tracking compatible with the video format used, so that the videos generated by RECORD-IT! can be easily used in those applications with no more work than to install the appropriate video decoder modules.

All the Panlab designed RECORD-IT! solutions (except the RECORDIT1 multimedia device) have been developed with the research task kept in mind, making them more convenient than standard DVD or any multimedia recording device.

- *Full compatibility with Panlab video-tracking (but use not exclusive to Panlab systems!).*
- *Systems available from 1 to up to 16 cameras.*
- *On-line, Off-line and Off/On-line combined video-tracking options.*
- *Built-in video recording solution included in all SMART 3.0 software platforms.*
- *External video recording solutions available for boosting the performances of your laboratory.*
- *Fast video-digital codifications.*
- *Unsure what to choose? Let our scientific team assist you!*

- Record each camera independently, that is, each camera could record the sequence at any time and during any time lapse freely defined by the User.
- Generate digital video files which could be processed with standard codecs in a Microsoft Windows environment (that is, no proprietary internal formats which can only be reviewed with specific software).
- Generate independent digital video files on-the-fly (that is, without needing exportation and/or post-generation processes) for each rec-stop sequence.
- Easy methodology provided for identifying each video sequence recorded (for example, labelling them with the camera number, date and time).
- Simple upload of each independent video sequence recorded to a PC via a simple copy/paste function.
- Possibility of recording video digital files of size greater that 2GB (not possible when using DVD recorder).
- Full support provided by Panlab's Technical Support Department. Let us assist in configuring the solution that is right for your needs...and we will be there to help get you up and running!

BUILT-IN RECORD-IT!



RECORD-IT!1USB

RECORD-IT!4 to 16

	Built-in RECORD-IT! BASIC NEEDS	RECORD-IT!1USB MEDIUM NEEDS	RECORD-IT!4 to 16 ADVANCED NEEDS
SMART built-in / External solution	SMART V3.0 BUILT-IN option - Recording settings and START/STOP are directly available from the SMART V3.0 software image source player.	EXTERNAL - Panlab designed RECORDIT!1USB software solution provided with the CONANAVUSB digitizer.	EXTERNAL - Panlab computer-based designed complete solution provided with RECORDIT! software and hardware (computer + multiple camera digitizer card).
Computer dependency	Always on the same computer as SMART.	Requires a computer - either system running SMART or another.	Need to be used in a different computer than SMART.
Digital video recording / Tracking simultaneous process of the same experiment.	YES - Both Video Tracking and Video Recording of the current experiment can be done simultaneously.	YES - Only when SMART and RECORDIT!1 USB software are installed in a different computer (they cannot be ran at the same time with the same image source in the same computer) and using adequate T-connector. Not possible with webcam.	YES - Only when purchased with the RECORDITLIVE options.
Digital video file specifications	Xvid format, short/medium duration: depends of computer performance and HD size (4 Mb/min).	Xvid format, short medium duration: depends of cumputer performance and HD size(4 Mb/min).	MPEG-4 format- support long duration recording.
Image source	Compatible with any image source detected by SMART 3.0 (webcam, WIA camera, camera conected to the CONVANAUSB o FRBOARD3 digitizers).	Compatible with any image source detected by SMART 3.0 (webcam, WIA camera, camera conected to the CONVANAUSB or FRBOARD3 digitizers).	Analog cameras.
Convenience	HIGH - Integrated solution & simultaneous tracking. Can work on laptop.	MEDIUM - Independent system, still handy and user-friendly. Can work on laptop.	MEDIUM/HIGH - Independent system, still handy and user-friendly. Multiple-cameras easy set-up!
Performance	LOW - very demanding when recording is done simultaneously to tracking. From 10-25 fps for webcam and USB digitalizer, 25 fps with PCI digitalizae. Needs high computer performance: 2-3 GHz multicore, 2-4 RAM, HD500Gb, W7 32-64bits.	MEDIUM - From 10-25 fps for webcam and USB digitalizer, 25 fps with PCI digitalizer. Needs low/ standard computer performance: 1 GHz multicore, 1 RAM, HD500Gb, W7 32-64bits.	HIGH - From 25 fps (PAL) to 30 fps (NTSC) of 4 to 16 cameras with the optimal resolution needed for tracking process. Provided with independent high-performance computer: 3 GHz dual-core, 2 RAM, HD-1Tb, W7 32-64bits.
Camera Nb. & Productivity	LOW - one camera; single experiment at a time.	MEDIUM - one camera; can be used independently from SMART, each one in a different experiment.	HIGH - multiple cameras, can be used independently from SMART, each one in a different experiment.
License key	SMART USB Flash License key. Needed for recording video files.	Specific RECORDIT!1USB Flash License key. Needed for recording video files.	Licence key included electronic.
SMART V2-5, & Smart JUNIOR compatibility	NO - only available with the SMART V3.0 platform.	YES - Fully compatible with the condition that related codecs are installed. The recorded videos can be opened from these versions.	YES - Fully compatible with the condition that related codecs are installed. The recorded videos can be opened from these versions.
Other specific features	None	None	User selectable quality levels in order to minimize the HD space and to maximize the precision of the tracking process, if required.
Quality/price ratio	Cost-saving solution - provided with any SMART V3.0 platform without any additional cost!	MEDIUM/LOW if the user already has a computer to run it.	HIGHER cost - for advanced needs.

SMART 3.0

ORDERING INFORMATION

SMART3.0 PACKS	
SMARTBASIC	SMART 3.0 BASIC PACK (see bellow)
SMARTSUPER	SMART 3.0 SUPER PACK (see bellow)
SMARTPREMIUM	SMART 3.0 PREMIUM PACK (see bellow)
SMART3.0 PLATFORM	
SMART V3.0	SMART platform incluing SMARTRC (needs Experimental Modules)
SMART EXPERIMENTAL MODULES	
SMARTCS	Customizable Experiment Module for any kind of enclosures
SMARTOF	Preconfigured Module for Open-field Exp.
SMARTWM	Preconfigured Module for Water-maze Exp.
SMARTPM	Preconfigured Module for Plus-maze Exp.
SMARTTY	Preconfigured Module for T/Y mazes Exp.
SMARTCPP	Preconfigured Module for Place Preference Exp.
SMARTFST	Preconfigured Module for Forced-Swimming Test & Tail-Suspension Test Exp.
SMARTSI	Preconfigured Module for Social Interaction Exp. & Multiple-Subject Extension for SMARTCS (up to 8 animals in a single arena)
SMART EXTENSIONS	
SMARTGA	Global activity Extension
SMARTMA	Multiple Arenas Extension (one animal per arena - more than 100 arenas available!)
SMARTTW	TriWise Extension for detection of head, center mass and base-tail
SMARTIO	SMART Input-Output Extension - only under customer specific requests

SMART SPARE PART	
SMARTRC	Remote data acquisition start/stop control (wireless technology)
CAMERAS & ACCESORIES	
CAMCOLORPAL	Analog Sony Color (PAL) Camera & lens
CAMBWPAL	Analog Sony BW (PAL) Camera & lens
CAMCOLORNTSC	Analog Sony Color (NTSC) Camera & lens
CAMWEB2	High Resolution WebCam
CAMIRULTRA	Microcamera B&W pinhole
CAMIRMINI	Microcamera with IR leds
CAMROOF	Camera Fixation System (roof)
CAMTRIPOD	Camera Fixation System (standard tripod)
IMAGE SOURCE DIGITALIZATION	
CONVANAUSB	Analog/Digital video converter (USB) - for laptop and desktop
FRBOARD3	Analog/Digital video converter (PCI board) - only for desktop
DIGITAL VIDEO RECORDING (cameras not included)	
RECORDIT1USB	Video digital software recorder for 1 image source (includes 1 analogical/Digital USB converter)
RECORDIT4	Digital video recorder for up to 4 image sources
RECORDIT8	Digital video recorder for up to 8 image sources
RECORDIT16	Digital video recorder for up to 16 image sources
RECORDITLIVE4	Cables, adapters and multiplexer/switch for up to 4 cameras
RECORDITLIVE8	Cables, adapters and multiplexer/switch for up to 8 cameras
RECORDITLIVE16	Cables, adapters and multiplexer/switch for up to 16 cameras
RECORDITMON	HDMI monitor accessory for RECODIT1-16 systems
MAZES & ENCLOSURES	

Panlab Harvard Apparatus offers a wide range of enclosures and mazes for your experiments. Ask your Sales delegate for more information!

SMART-RC remote START/STOP control included in all SMART V3.0 platforms!

Consult our webpage for computer requirements!

Save money with our SMART PACKAGES!

Don't miss the oportunity to get more, at lower price!

BASIC PACK

Enjoy of the full flexibility of the SMARTCS module for 1 animal in one arena. Tracking and Global activity detection available. Built-in Recordit! Digital video recorder, Remote control and Analog/Digital USB video converter included!

- SMART V3.0
- SMARTCS
- SMARTGA
- CONVANAUSB

SUPER PACK

Enjoy the full flexibility and capabilities of the BASIC PACK. Increase both productivity and the scope of your studies with the SMARTMA (multiple arena) and SMARTTW (3-point detection) extensions.

- SMART V3.0
- SMARTCS
- SMARTGA
- CONVANAUSB
- SMARTMA
- SMARTTW

PREMIUM PACK

Enjoy the full flexibility and capabilities of the SUPER PACK. Save time with the preconfigurated zone templates, runtime panels and calculations provided by the SMART experiment-targeted modules. Track several subject in the same arena (SMARTSI module).

- SMART V3.0
- SMARTCS
- SMARTGA
- CONVANAUSB
- SMARTMA
- SMARTTW
- SMARTOF
- SMARTWM
- SMARTPM
- SMARTTY
- SMARCPP
- SMARTFST
- SMARTSI